Role of the intra-oceanic tectono-sedimentary architecture in the Alpine tectonic evolution of the Monviso meta-ophiolite Complex (western Alps)

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The eclogite-facies Monviso meta-ophiolite Complex (MO) in the western Alps represents a fragment of oceanic lithosphere which recorded the evolution of an oceanic core complex formed by mantle exhumation along an intra-oceanic detachment fault (*i.e.*, the Baracun Shear Zone, BSZ; Festa et al., 2015), related to the Jurassic extensional tectonics and opening of the Ligurian-Piedmont oceanic basin (Alpine Tethys). This detachment fault, which consists of mylonitic serpentinite and talcschist embedding blocks of metagabbro, juxtaposes massive serpentinite with bodies of metagabbro, and syn-extensional metasediments (*i.e.*, calcschist with levels of mafic metasandstone and metabreccia) and metabasalt in its footwall and hanging wall, respectively (Balestro et al., 2015a). Both the BSZ and its footwall and hanging wall were unconformably sealed by Lower Cretaceous post-extensional metasediments (*i.e.*, calcschist with levels of marble and quartz schist). These tectono-stratigraphic relationships are now deformed by large-scale folding with a significant component of shearing, occurred during the long lived Alpine tectonic evolution of the MO, resulting from (i) the Late Cretaceous to Middle Eocene subduction, (ii) the Late Eocene-Early Oligocene collision and W-verging accretion, and (iii) the Late Oligocene to Neogene westward tilting driven by deep crust/mantle indentation (Balestro et al., 2015b, and reference therein). Our findings show that the Alpine-related deformation and final MO architecture were strongly controlled by the characteristics of the inherited tectono-sedimentary architecture such as (i) lateral and vertical variations of facies and thickness of metasediments, (ii) intra-oceanic fault-rock assemblage, which acted later as weak horizons in concentrating deformation, and (iii) occurrence of remnants of a volcanic ridge segment. Our results show that the recognition of the tectono-stratigraphic architecture of the pre-collisional (Jurassic) geodynamic setting represents an important step in better reconstructing the tectonic evolution of meta-ophiolite units in orogenic belts.

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